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18 May 1960

NOTE:

A. 1. In making the voice recordings used in all intelligibility tests associated with the ASR-1 receiver, the input to the tape recorder was taken from the "AUDIO P.A." jack of the ASR-1. In field use the input into the tape recorder is normally taken from the "AUDIO DET." jack of the ASR-1.

2. The audio signal, when taken from the "AUDIO DET." jack, is independent of the audio gain setting of the receiver. The output at the "AUDIO P.A." jack, however, is controlled directly by the audio gain control.

3. The frequency response viewed at the "AUDIO P.A." jack drops off ⁴⁰⁰very rapidly at frequencies below 1000 cps, while at the "AUDIO DET." jack it remains essentially constant from 50-1000 cps. The response above 1000 cps drops off at approximately the same rate for both jacks.

B. 1. At several points in the text of this report, reference is made to the bandwidth of the ASR-1 placing a limitation on the allowable deviation of the RT-3R. It is felt that if the RT-3R deviation is set as suggested in the RT-3R operation manual, the input from an operational microphone installation would have insufficient amplitude to cause the transmitter deviation to exceed the bandwidth of the ASR-1.

~~NOTE:~~ The above information should be kept in mind when reading paragraph 2.10 and all other portions of the report concerned with the performance of the microphone, transmitter, and receiver when used as a system.

ORIGINAL CL BY 235979
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 REASON 3 d(3)

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B. 1. The RT-3R transmitter is normally ~~paired~~ ^{supplied} with a MC-30 microphone ~~when arranged in the field~~. When ~~this~~ ^{an arrangement is made} the RT-3R and MC-30 are used in conjunction with the ASR receivers ^{5 KC per 100 MV. RT-3R}. This deviation setting as suggested in the RT-3R operation manual, is adequate. However, when the BK-6B microphone is used with the RT-3R and ASR receiver, the RT-3R deviation should be set to its maximum value. ^{This max value} ~~which~~ was shown to vary from 19 KC to 33 KC per 100 MV. ^{input.} for the units tested in this report. This larger deviation setting ~~is necessary~~ allows the BK-6B — RT-3R system to make full use of the ASR deviation limits. ^{This larger} ~~RT-3R deviation setting is necessary~~ since the signal fed to the RT-3R from the ~~AAC-30~~ ^{BK-6B} microphone is approximately ~~17~~ ¹⁷ dB below ~~that~~ ^{that} from a ~~MC-30~~ ^{MC-30} microphone, with equal sound pressure levels. This greater deviation sensitivity of the RT-3R, when the BK-6B, RT-3R, and ASR are used as a system, should decrease the effect of noise on the system intelligibility.

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MC-30
OUTPUT

E @ 71 db SP = 250 MV. for MC-30

E @ 86 db SP = 1400 MV. for MC-30

E @ 78.5 db SP = 600 MV. for MC-30

$$20 \log \frac{E_{\text{OUT OF MC-30}}}{E_{\text{OUT OF BK-LB}}} = 7.1 = 17 \text{ db}$$

$$600 \text{ MV.} = 10^{-\frac{x}{20}}$$

$$1670 = 10^{\frac{x}{20}}$$

$$\text{let } \frac{x}{20} = y$$

$$10^y = 1670$$

$$y = 3.23$$

$$x = 20y = 20(3.23) = 64.5$$

$$\text{S.P. for above } x = (69 - 64.5) + 74 = 4.5 + 74$$

$$= \underline{\underline{78.5 \text{ db}}}$$

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BK-6B

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OUTPUT

E @ 71 db sp. = 35.4 MV. for BK-6B

E @ 86 db sp. = 200 MV. for BK-6B

E @ 100 db sp. = 1000 MV. " "

E @ 95.4 db sp. = 600 MV. " "

$$600 \text{ MV.} = 10^{-\frac{x}{20}}$$

$$1670 = 10^{\frac{x}{20}}$$

$$\text{let } \frac{x}{20} = y$$

$$10^y = 1670$$

$$y = 3.23$$

$$x = 20y = 20(3.23) = 64.6$$

$$\text{S.P. for drive } x = (86 - 64.6) + 74 = 74 + 21.4$$

$$= \underline{\underline{95.4 \text{ db.}}}$$

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JAITH30THAOJ $-\frac{x}{20}$

$$100 MV = 10$$

$$10,000 = 10y$$

$$y = 4$$

$$\frac{x}{20} = 4$$

$$\underline{\underline{x = 80 \text{ dB}}}$$

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an MC-30 for equal ^{microphone} sound pressures. This greater deviation sensitivity of the RT-3R, when the BK-6B, RT-3R, and ASR are used as a system, should decrease the effect noise, picked up by the BK-6B, has on the system's intelligibility.

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B. 1. The RT-3R transmitter is normally ~~used~~ ^{used} with an MC-30 microphone in ~~the~~ ^{the} field. ~~use~~ When this arrangement is used in conjunction with an ASR receiver, the 5 ~~KC~~ ^{KC} per 100 μ V transmitter deviation setting, as suggested in the transmitter operation manual, is adequate. However, ~~when~~ ^{when} the BK-6B microphone is used with the RT-3R transmitter and ASR receiver, the ~~the~~ transmitter deviation ^{capability} should be set to its maximum value, which is shown to vary from 19 KC to 33 KC per 100 μ V. ~~point~~ for the units tested in this report.
 > This ~~greater~~ ^{greater} deviation ^{sensitivity} ~~setting~~ is necessary to allow the BK-6B — RT-3R system to make fullest use of the ASR deviation ^{capability} ~~limits~~, since the amplitude of a signal fed to the transmitter from the BK-6B is approximately ~~18~~ 18 % of that from

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JATVEG-100

Since the output from a BX-6B is 15 dB below that of an MC-30, this transmitter deviation

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undue distortion.

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graph ordinate represents response and is a function of $\left(\frac{\text{voltage}}{\text{pressure}}\right)$.

EXAMPLE: BK-6B CURVE WITHOUT AMPLIFIER.

RESPONSE = -86 db max

25X1

25X1

SUPPOSE S. P. AT MIC

15+71 db re $\frac{.0002 \text{ dyn}}{\text{cm}^2}$

AMPLITUDE OF MIC OUTPUT IS CALCULATED AS FOLLOWS:

VOICE PRES. = -3 db re $\frac{1 \text{ dyne}}{\text{cm}^2}$ (74-71)

$$E = -86 + (-3) = -89 \text{ db re 1 VOLT}$$

$$20 \log \frac{E}{1 \text{ V.}} = -89$$

$$E = 10^{-\left(\frac{89}{20}\right)} (1 \text{ V.}) = 10^{-4.45} = 35.4 \text{ MV.}$$

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freq. = 15 Kc

20 MV.

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freq.	PA	det.	.05 @ 1 Kc
50	-11.5	0	
100	-6.0	0	
400	-1.0	0	
1 Kc	0	0	.05 V.
5 "	-1.0	-1.5	
7.5 "	-2.5	-3.0	
10 "	-7.0	-5.0	.028 V.

freq. = 50 Kc

			DET. DIST.	P.A. DIST.
50	-11.5	0		
100	-6.5	0		
400	-1.0	0	1.7 %	4.3 %
1 Kc (.16 V)	0	0		4.3 %
5 "	-4.0	-4.5		
7.5 "	-8.0	-8.0		
10 "	-11.5	-10.0		5.0 %

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30 KC DEV. $\bar{0} = +4 \text{ dbm}$

freq.	PA	DET
50	-11.5	0
100	-6.0	0
400	-1.0	0
1 KC (10V)	0	0
5 KC	-2.5	-2.0
7.5 KC	-6.0	-5.0
10 KC	-9.5	-7.5

31 db $\frac{\text{SIG}}{\text{NOISE}}$ @ 50 KC DEV. $\rightarrow 20 \mu\text{V in}$ 29 db " " @ 30 KC DEV. $\rightarrow 20 \mu\text{V in}$ 27 db " " " " $\rightarrow 1.5 \mu\text{V in}$ 28 db " " " " $\rightarrow 1.5 \mu\text{V}$

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What deviation used? 10 KC

Output power level for various gain settings? (at 1 Kc)

Check original data to make sure that response falls off at high frequencies with max. gain.

Why did you reverse yourself in 2.10

How was receiver output ~~measured~~
VOLTAGE - BALLANTINE

Was Z matched between BK-6B & ~~RT-3R~~ ~~AFRT~~

559

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Conclusions Sect 2.8.

2.06

equip ceased to operate

Page 3.08 probably part of Pet's reasoning
ASR-1 G & C.

Page 5.09. states here deviation is sufficient to
blame usefulness is limited
before you said operation ceases
over 40°C (conclusions)

Figure 4.5^b does show noise deviation.
going up some with temp 4.5 kC. etc

Curve Page 4.59 shows noise deviation
stability after $2\frac{1}{2}$ hours.

Question (over test) we don't know how
hot Xuti is either on skin or
inside

$150^{\circ}\text{F} = 65^{\circ}\text{C}$ it worked. how can
you say it doesn't work at $40-50^{\circ}\text{C}$

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Page 4.17

Curves 4.47, 4.48 show power output
always above spec.

" 4.49, 4.50 in temp cycle noise
deviation does occur but
nowhere did unit cease to operate
one went from 0 - 0.8 kc
the other 0 - 5 kc
should have tested noise units

Again we don't know what temp of
equipment was.

Statements in conclusion lead one
to believe that oven tests
are not valid or equipment should
have ceased to operate.

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Conclusions should be based only on
[redacted] ~~not~~ my made to over -

25X1

no where in [redacted] do you give
any evidence into ~~your~~ ^{your} ~~unit~~ ^{unit}.

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Page 6.29 Table 605.

worst condition

deviation up to	12.2 kc	
unit temp vsi	25- 29.5°C	^{UN INSULATED} 26- ^{INSULATED} 35.1°C
Power Supply	27- 31.9	28- 40.5°C

Page 3.07 said: 30°F - 150°F deviation
~~varies~~ ^{varies} from 7kc to 13.4kc.

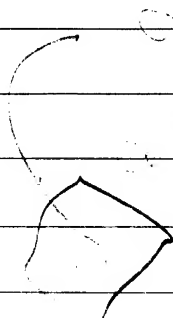
Page 3.08 ^{talking about over test}
at bottom in summary
my moderately affected.
'exception' of our unit
should have checked another
[redacted] ~~and did operate~~ ^{CONFIDENTIAL} unit.

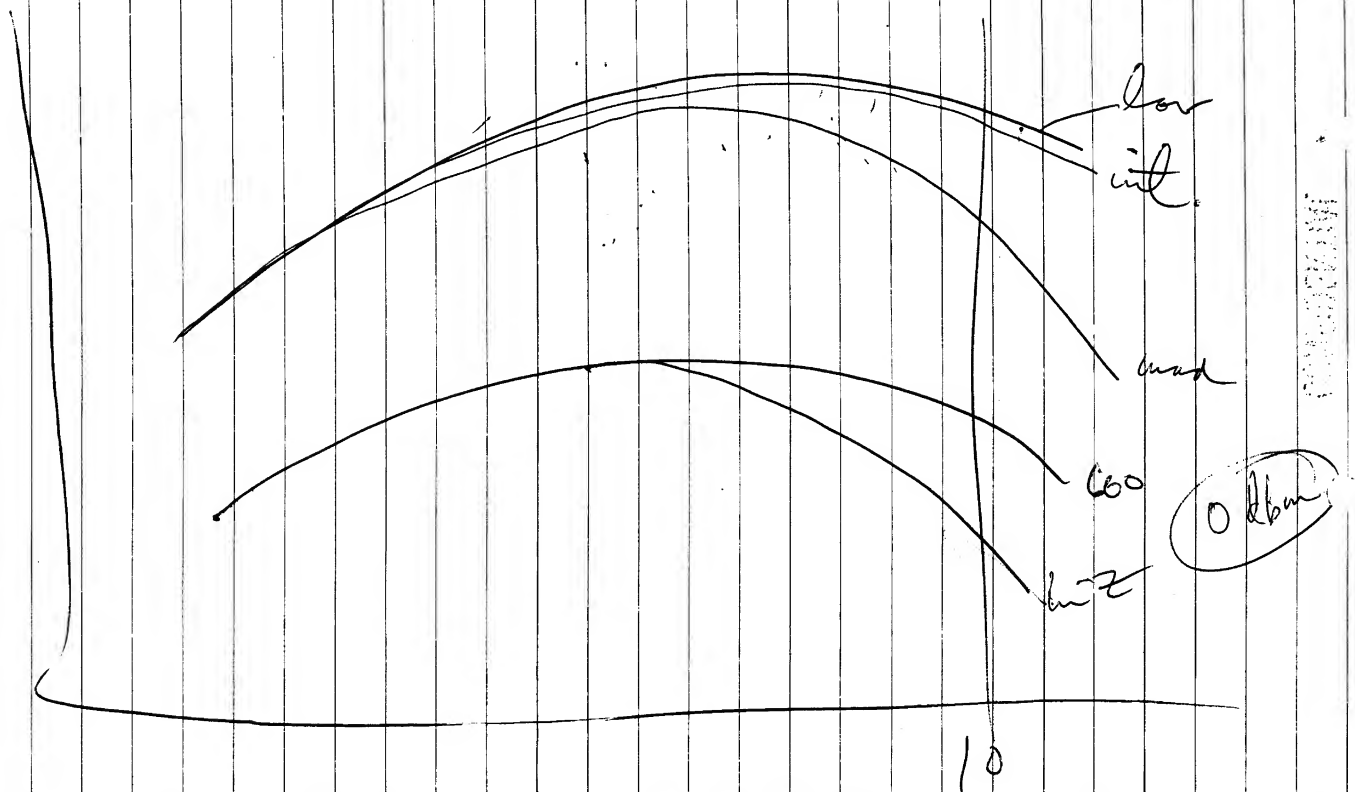
With Filter**CONFIDENTIAL**10 μ v. 30 Kc deviation

100	+3	-4.5	-7	-7	-12	-7
400	+7.5	0	-0.5	-0.5	-5.5	-0.5
1K	+7.5	0	0	0	-5	0
5K	+1.5	-6	-9	-9	-13	-8
7.5 K	+2	-5.5	-10	-10	-13.5	-8.5
10 K	-0.5	-8	-15.5	-15.5	-19	-14



hf

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10 Kc duration ~~CONFIDENTIAL~~

	max gain			-4 dbm	
100	-3.5 -6			-11 -7	
400	+1.5 -1			-5 -1	
1K	+2.5 0	0	0	-4 0	0
5K	+2.5 0			-6 -2	
7.5K	2 -0.5			-8.5 -4.5	
10K	1 -1.5			-11 -7	

50 Kc duration

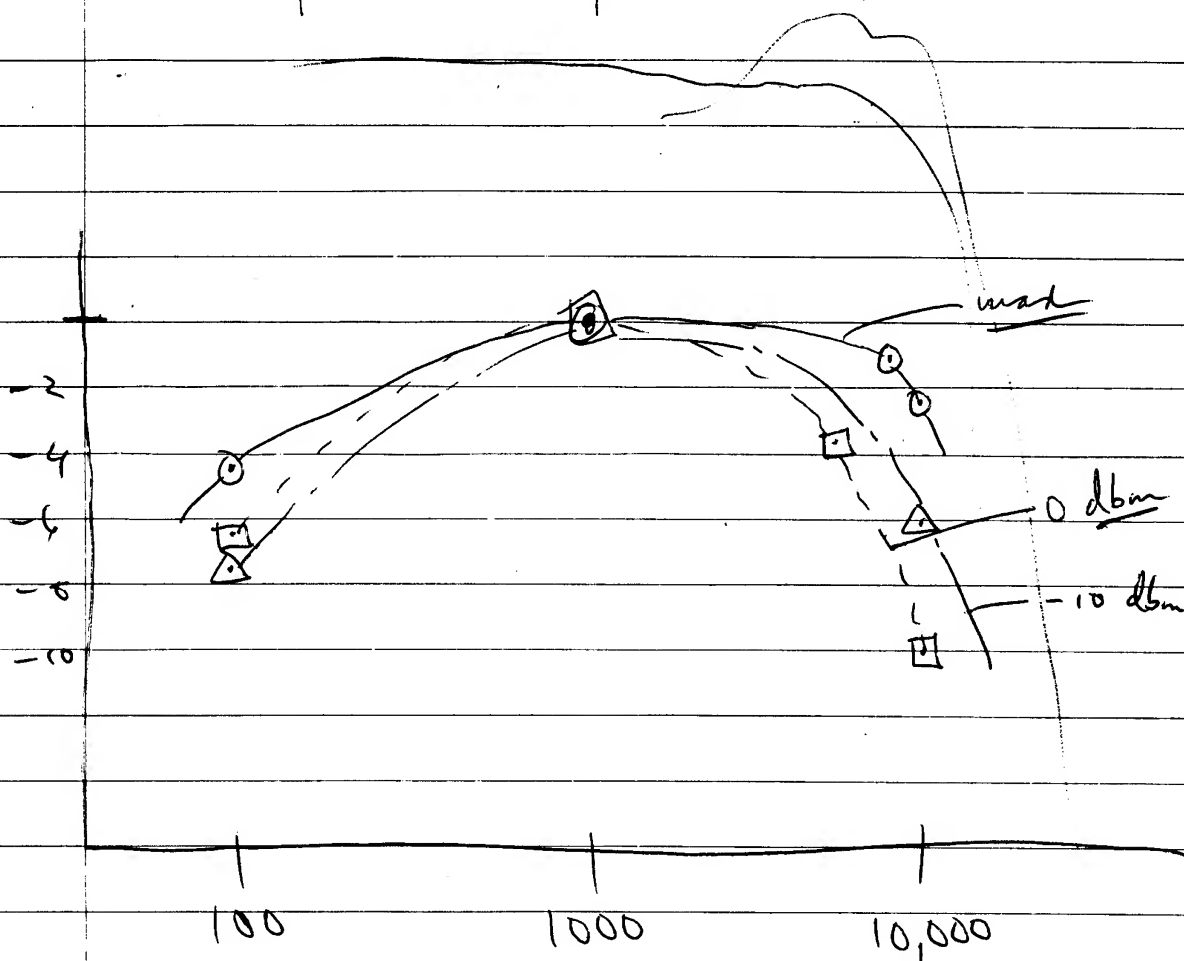
	max		-4 dbm	
100	3 -4		-11 -7	
400	6.5 -0.5		-5 -1	
1K	7 0		-4 0	
5K	7 0		-7.5 -3.5	
7.5K	6.5 -0.5		-10.5 -6.5	
10K	5.5 -1.5		-13.5 -9.5	

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10 μ v. 50 kc deviation

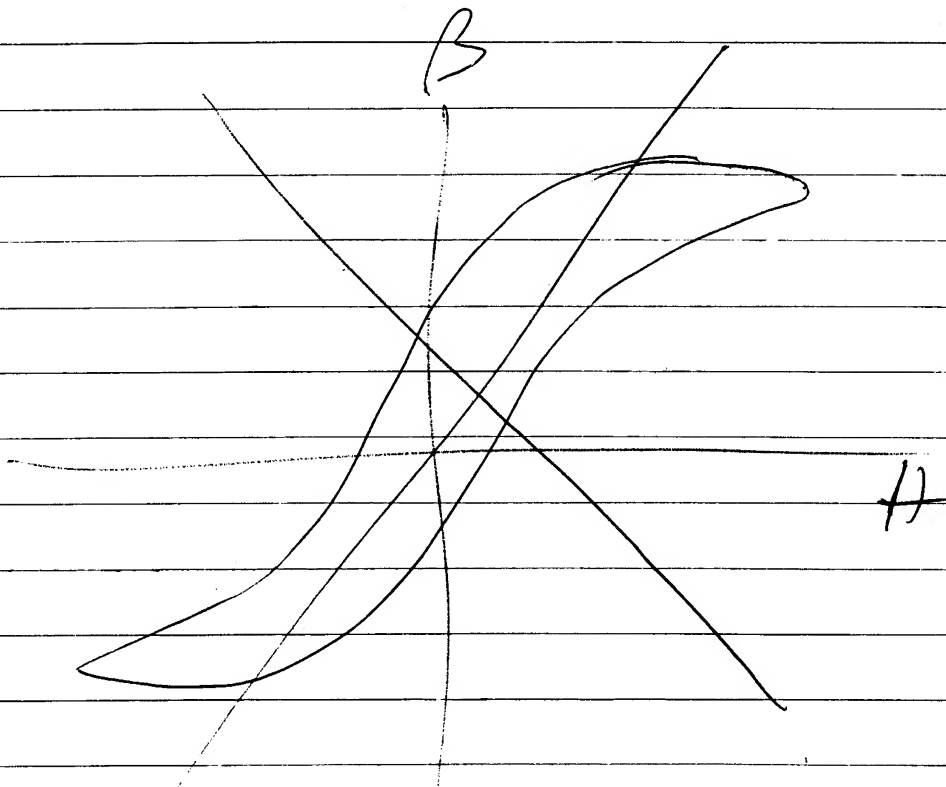
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	max gain	hi int.	low	-4 dbm low int.
100	2.5 -4.5	-6.5 -6.5	-17 -7	-11 -7
400	6.5 -0.5	-1 -1	-11 -1	-5 -1
1K	+7 0	0 0	-10 0	-4 0
5K	7 0	-3.5 -3.5	-11 -1	-5.5 -1.5
7.5K	6 -1	-6.5 -6.5	-13.5 -3.5	-9 -5
10K	4.5 -2.5	-10 -10	-16 -6	-12 -8



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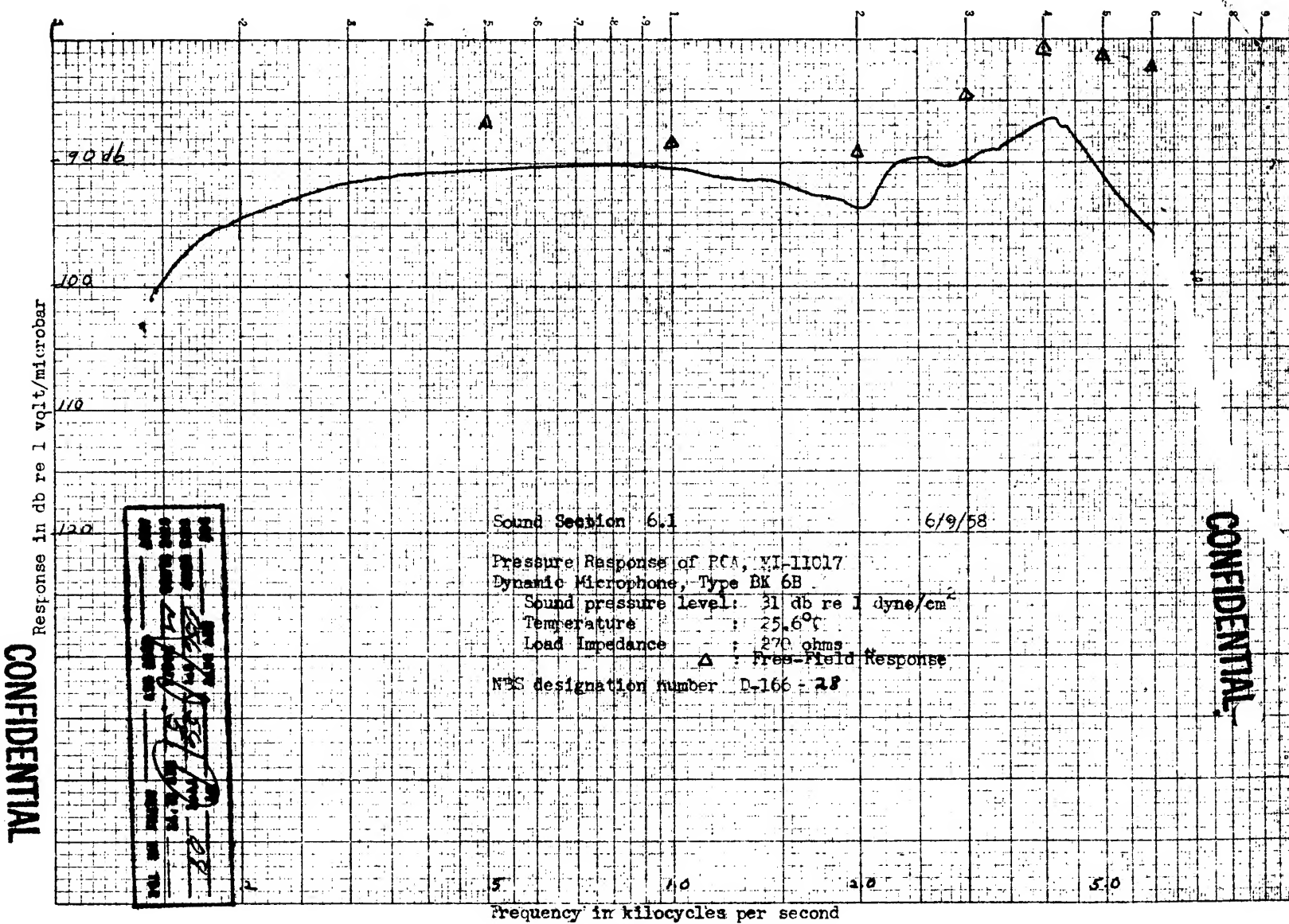
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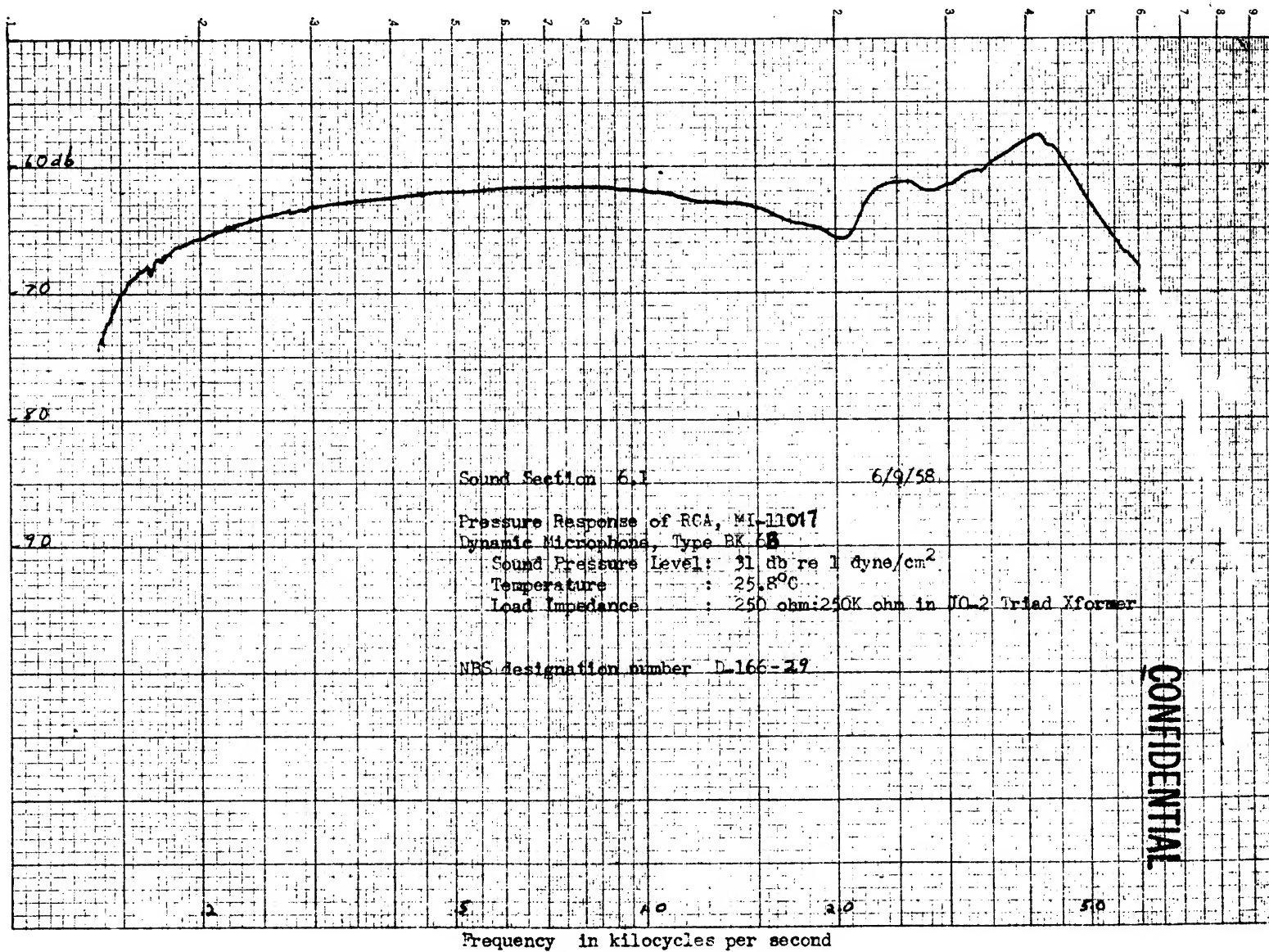
TRANSMITTAL SLIP		DATE 21Feb61
TO: TSD/EB, 		
ROOM NO. 210	BUILDING Westout	
REMARKS: I can not be sure whether I got the attached from you or If they are not yours, will you kindly send them to him. Thanks. <div style="text-align: right; margin-top: 20px;"> <i>W3H</i> <i>Rec'd EB</i> <i>21</i> </div>		
FROM: TSD/TAG		
ROOM NO.	BUILDING	EXTENSION

25X1

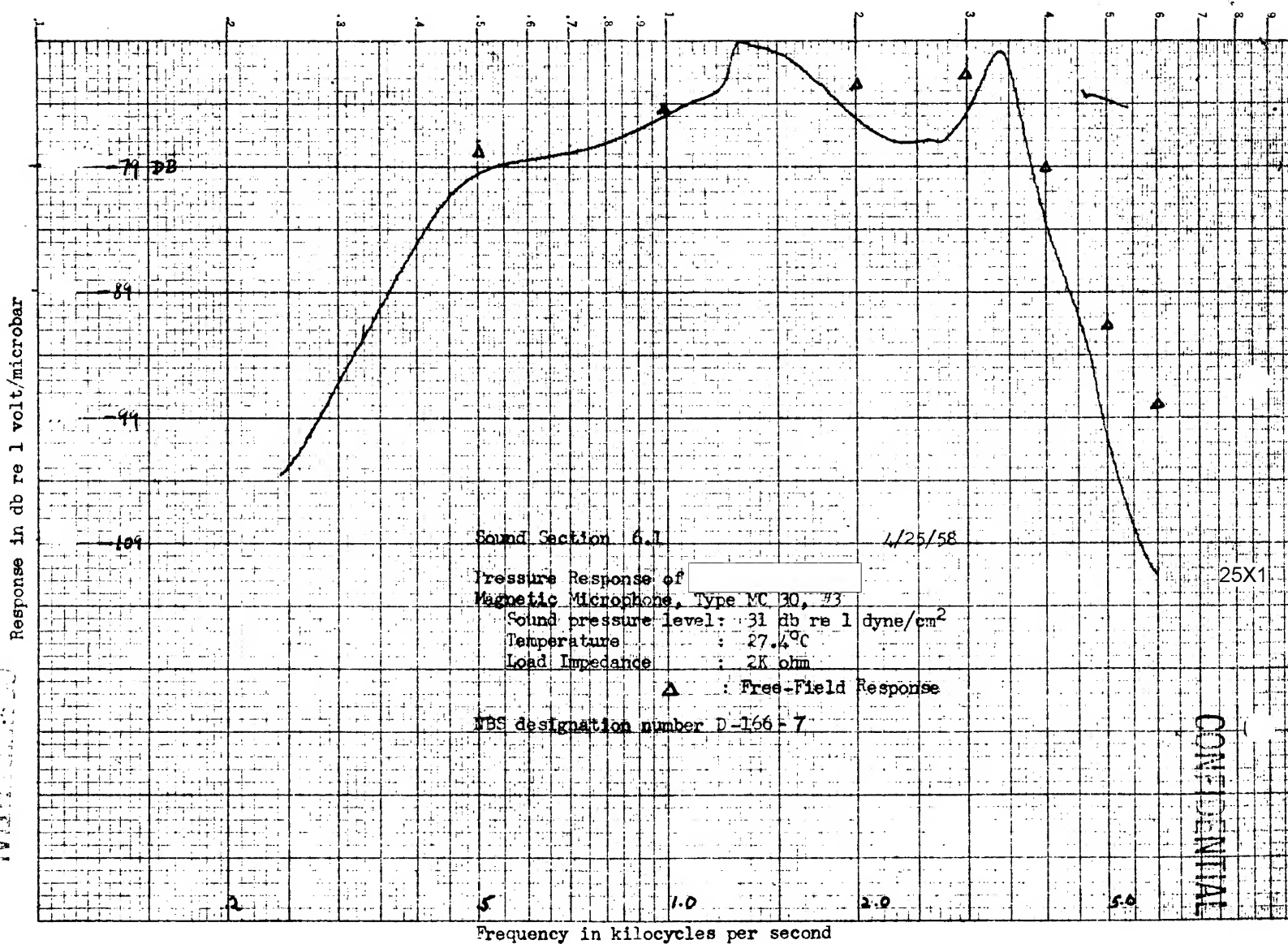
25X1

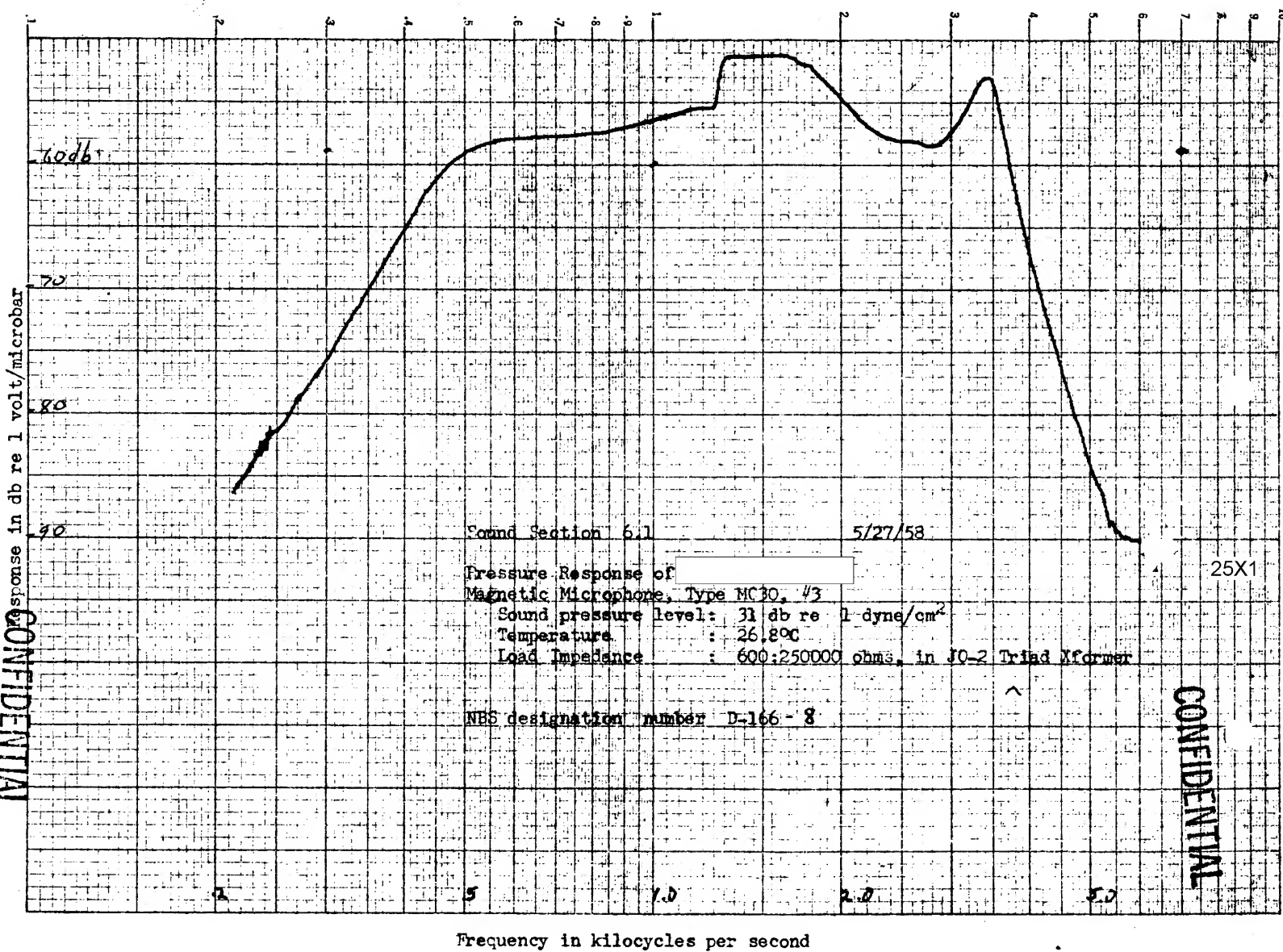


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response in db re 1 volt/microbar



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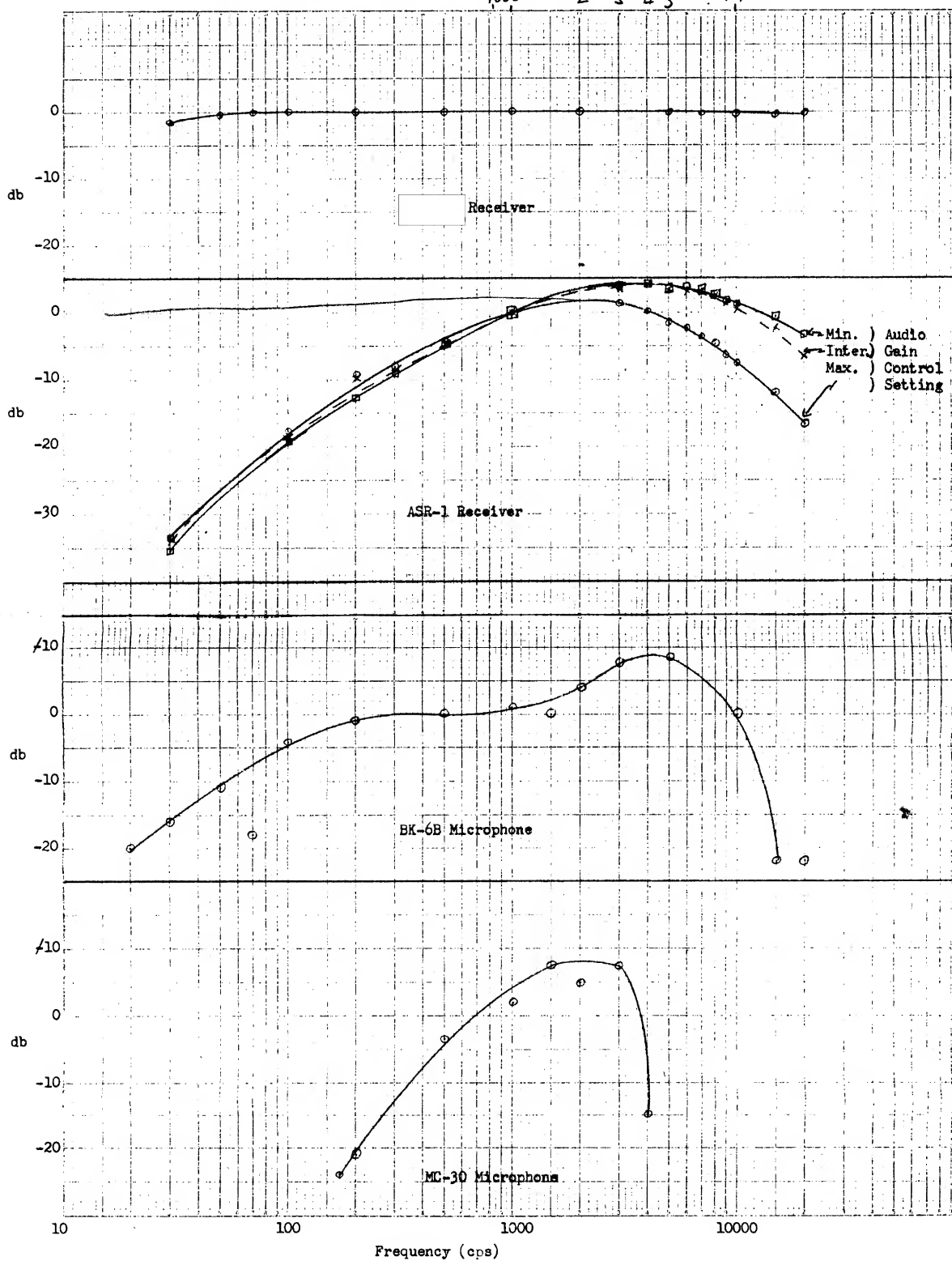




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25X1

Audio Frequency Response For Two Microphones & Two Receivers



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